

of "bogs and meadows" (Britton & Brown), and of "rich alluvial shores, rarely in swamps" (Grays Manual, 7th ed.). The var. *niagarensis*, where observed by me, was a resident of level, poorly-drained, open woodland and thickets, confined to edges of vernal pools and depressions where moisture lingers well into the hot days of summer, but where the surface soil-layers dry out and crack before the akenes are mature.

My drawings are from specimens preserved unpressed especially for this purpose, all from the type material of the variety herein described, excepting the perigynium marked "c," referred to above.

MARYLAND AGRICULTURAL EXPERIMENT STATION,
College Park, Maryland.

THE NAME OF THE HEMLOCK SPRUCE.

ALFRED REHDER.

UNDER the title "The correct name of the hemlock spruce" an interesting article by Oliver A. Farwell appeared in the December number of the Bulletin of the Torrey Botanical Club (Vol. XLI, 621–629). As I cannot agree with some of the statements made by the author and particularly with his conclusion that the correct name of the Hemlock Spruce ought to be *Tsuga americana*, I venture the following remarks to show that the name *Tsuga canadensis* for this tree should be retained.

In fixing the type of *Pinus canadensis* Linnaeus (*Spec. Ed.* 2, 1421) one has to consider that the diagnostic phrase is taken nearly literally from the synonym of Gronovius. This shows as clearly, as if Linnaeus had expressly designated the Gronovian plant as the type of his species, that his *Pinus canadensis* is based primarily on the plant described by Gronovius; that this is the Hemlock Spruce there can be no doubt, as Farwell himself admits. To Farwell's further deductions, however, I cannot subscribe; he says: "If we take the first synonym enumerated under a species in case no type is specifically named, then *Pinus canadensis* becomes a pure synonym of *Pinus balsamea* Linnaeus, for the first synonym cited under both species is the same Gronovian

species which is the Hemlock Spruce.” According to the Philadelphia Code, the taking of the first synonym as the type is only resorted to when there is no other way to determine the type, but this is not so in this case, for, we find that here again Linnaeus indicates in his diagnostic phrase what he considers the type of his *Pinus balsamea*; that phrase is abstracted from the detailed description of the leaves of his species and not from any of the synonyms, as in none of them is any mention of subemarginate leaves or of their two white lines beneath. By reading carefully Linnaeus’ description and taking into consideration the geographical distribution he attributes to his species we must come to the conclusion that he had in mind a true Fir, and as there are only two species, namely *Abies balsamea* and *Abies Fraseri* native to eastern North America and as the latter was not known at that time, no botanist having then penetrated to the higher altitudes where *Abies Fraseri* grows, Linnaeus could have meant no other species but *Abies balsamea*. From the detailed description he gives we may assume that he had specimens before him, either from a cultivated tree or from the collection brought back by Kalm who may have come across this species during his travels. Also the specific name “balsamea” shows that he got his information elsewhere and not from the synonyms where no reference to “balsam” occurs. I cannot understand how Farwell can assert that “there is absolutely nothing in the descriptive matter that will limit it to any species.” The comparison with *Pinus Picea* excludes the Spruces and the description of the leaves as broader than those of the Silver Fir excludes the Hemlock Spruce, and neither *Tsuga canadensis* nor any of the Spruces have the white bands of the underside of the leaves composed of 8 rows of stomata; the former has only 5 or 6 and the Spruces even less, while *Abies balsamea* has indeed usually 8 rows of stomata.

Miller adopted binomial nomenclature in the 8th edition of his Dictionary and gave specific names under *Abies* to four American species which he had already distinguished but not specifically named in 1759 in the 7th edition of his Dictionary. In transferring the Linnaean specific names from *Pinus* to *Abies* he made the mistake, if it really was his intention to transfer the names, of transferring the name *canadensis* to the previously unnamed species No. 5 of the 7th edition, probably because this number was placed by Linnaeus as a synonym under his *Pinus canadensis*, and of creating a new name for No. 3 which ought to have been called *A. canadensis* according to the

rule of priority. That Miller used the name *canadensis* for the White Spruce does not change the fact that *canadensis* is the oldest specific name for the Hemlock Spruce, since the Hemlock Spruce is the type of *P. canadensis*, as shown above, and since no subsequent author can change the type of a species previously described. Farwell asserts that Miller in splitting *Pinus canadensis* into two species could choose, if the names are of the same date, and that his choice could not be modified according to article 46 of the International Code. Now article 46 reads: "When two or more groups of the same nature are united, the name of the oldest is retained. If the names are of the same date, the author chooses and his choice cannot be modified by subsequent authors." As the wording shows this article does not refer to the division of species, but to the union of two or more species under one name. In article 47 which deals with the division of a species, nothing is said about the right of the author to choose, but the article rules that "if one of the forms was described earlier than the other, the name is retained for that form.

Therefore taking as proved that the type of *Pinus canadensis* is the Hemlock Spruce, "*canadensis*" remains the correct specific name for this tree and Miller's specific appellation is a non-valid¹ name having been formed contrary to the rules of nomenclature. More doubtful seems the validity of Miller's *Abies canadensis*, but as Miller does not quote *Pinus canadensis* Linnaeus as a synonym, *Abies canadensis* Miller may be considered a new name, and as the White Spruce had no earlier binomial appellation *canadensis* must stand as the oldest specific name, though the presence of an earlier homonym, viz. *Pinus canadensis* L., precludes the use of this specific name for the White Spruce, if transferred to the genus *Pinus*, and on the other hand the specific name "*canadensis*" cannot be used for the Hemlock Spruce, if transferred to the genus *Abies*, on account of the older *Abies cana-*

¹ The terms valid and non-valid have often been used indiscriminately for names which have become synonyms both for taxonomic or for nomenclatorial reasons. They should, however, be used for names only which belong to the latter category. This is made clear by the revised article 56 of the International Code (Act. Congr. Intern. Bot. Bruxelles 1910, I. 107) which reads: "Dans les cas prévus aux articles 51 à 55 le nom à rejeter ou à changer est remplacé par le plus ancien nom valable existant pour le group dont il s'agit et à défaut de nom valable ancien un nom nouveau (un binôme nouveau) doit être créé. Par nom valable on entend ici un nom et en particulier une combinaison de noms créés en conformité avec l'ensemble des règles de la nomenclature." A non-valid name always remains a synonym while a name which has become a synonym by change of generic or specific limitations may be revived at any time by another change in the taxonomic valuation of genera or species. A non-valid name, therefore, may be termed an unconditional synonym while a synonym for taxonomic reasons is a conditional synonym.

densis Miller.¹ If, however, one takes the view that *Abies canadensis* is not a valid name (see footnote on the preceding page), as it is against the rules of nomenclature in so far as Miller should have used this combination for the Hemlock Spruce, the oldest name for the White Spruce would be *Picea glauca* Voss in Mitt. Deutsch. Dendr. Ges. XVI. 93. 1907. (*Pinus glauca* Moench, Verz. Schloss Weissenstein, 73. 1785.—*Pinus laxa* Ehrhart, Beitr. III. 24. 1788.—*Pinus alba* Aiton, Hort. Kew III. 371. 1789.)

ARNOLD ARBORETUM.

FLORA OF THE VICINITY OF NEW YORK, A CONTRIBUTION TO PLANT GEOGRAPHY.—This "flora," by Norman Taylor,² will interest field-botanists of New England, for the area covered includes all of Connecticut as well as southeastern New York, all of New Jersey, and eastern Pennsylvania; and much emphasis is given to some of the geographic relations of the flora covered. The author's attitude is indicated by the statement in the Preface: "The attempt to explain the origin of the flora centering near the city, and the factors that have played their part in shaping its present composition, has, it seems to the writer, greater value than any enumeration of the species could possibly have." The author is modest in his approach to a vast question and, like most of those who enter such problems, has felt the handicap of too limited material for sound generalizations, saying: "no one is so conscious of the scarcity of such material as the writer. The book, therefore, is not so much a local flora as a method of writing one,—in some ways it is little more than a record of the incompleteness of our present knowledge."

As would naturally be expected, "the taxonomy and nomenclature have been brought into substantial accord with the second edition" of Britton & Brown's *Illustrated Flora*;³ but the author expresses a

¹ The combination *Abies Picea* Miller presents a case very similar to that of his *Abies canadensis*. If *A. canadensis* is considered a valid name, *Abies Picea* Miller must be considered a valid name also, for the oldest specific name for *Pinus Abies* cannot be used, as it would duplicate the name of the genus which is against art. 51, 2 of the International code, and a new specific name was necessary for which Miller choose *Picea*. In this case it is quite clear that it was not Miller's intention to transfer the Linnean name from *Pinus* to *Abies*, and the same may have been the case with *Pinus canadensis* L.; we may, therefore, in both cases consider Miller's names as new names. This will prevent the use of the name *Abies Picea* Lindley in Penny Cycl. I. 29 (1833) for the European Silver Fir for which the oldest name would then be *Abies alba* Miller, Dict. Ed. 8, no. 1. 1768. (*Abies pectinata* De Candolle, Fl. Franç. III. 276. 1805, not Gilibert, nor Poiret).

² Memoirs of the New York Botanical Garden, Vol. V. by Norman Taylor, pp. vi + 683. Issued January 30, 1915.

³ See RHODORA, xv. 220 (1913).